TABLE 1a. DEVICE DESCRIPTORS 1/

JPL PART NUMBER ST12243-	MFR. PART NUMBER	GENERIC PART NUMBER	DEVICE TYPE 2/	PACKAGE Style <u>3</u> /	ELECTRICAL PERFORMANCE CHARACTER-ISTIC	TERMINAL Connections	ELECT- RICAL TEST REQ'MNT S 4/	BURN-IN Circuit 4/
U 0 2953ADR	LP2953A	2953	02 ADD-ON	GDIP1-T16 (16-PIN DIP)	TABLE Ib	FIG. 1	TABLE II	FIG. 2

- NOTES: 1/ This drawing, in conjunction with CS515577 and Standardized Military Drawing (SMD) 5962-38765 Class S, imposes all requirements for procurement of these devices
 - <u>2</u>/ Refer to SMD 5962-38705.
 - 3/ Refer to MIL-STD-1835.
 - 4/ Screening shall be in accordance with SMD 5962-38705 Class S, except that Table II herein shall be substituted for Table II of SMD 5962-38705 Class S and SMD 5962-38705 Table III for device type8 2 add-on shall be the parameters from Table Ib. Electrical Performance Characteristics which have MIN and/or MAX LIMITS.
 - 5. Each lot shall pass Group E Subgroup 2 irradiation test to total irradiation dose (TID) of 100krads. The post-irradiation electrical test limits shall be those of Table III herein.
 - 6. This standard takes precedence over documents referenced herein.

5V TAP	1	16	REFERENCE
FEEDBACK =	2	15	COMP INPUT
INPUT 🗀	3	14	COMP OUT
GROUND _	4	13	GROUND
GROUND	5	12	GROUND
OUTPUT 🗀	6	11	NC
NC =	7	10	ERROR
SENSE =	8	9	SHUTDOWN

RELEASED THRU SECTION	DN 356 DAT	FIGURE 1	. TERMINAL CONNECTIONS				
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VENDOR PART NO		V	ENDOR	J PL PART NO	1		
	JET PROPULSI	ON LABORATOR	Y CALIFORNIA INSTITUTE OF	TECHNOLOGY		CF	AGE NO 23835
Procurement specification: CS515577 Screening specification: ZPP-2073-GEN	TITLE:	MICROCIRCUI	T, LINEAR, VOLTAGE REGULATOR, LOW Adjustable, Micropower	-DROPOUT,			ETAIL Fication
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Custodian: Electronic Parts Reliability Section 514					S	HEET 1 OF	5

TABLE ID. ELECTRICAL PERFORMANCE CHARACTERISTICS

Subgroup 3 testing is done at -40 °C. Unless otherwise specified: $V_{tr} = 6V$, $I_{tr} = 1$ mA, $I_{tr} = 2.2 \, \mu$ F, Feedback pin is tied to 5V Tap pin, Output pin is tied to Output Sense pin, $I_{tr} = 5V$.

TEST	SYMBOL	SYMBOL CONDITIONS GROUP A SUI Groups		LIMITS		UNITS
				MIN	MAX	1
OUTPUT VOLTAGE	V ₀		1	4.975	5.025	V
			2,3	4.940	5.060	
		1mA <u>< l. ≤</u> 250 mA	2,3	4.930	5.070	
OUTPUT VOLTAGE TEMP. COEFFICIENT	∆V₀/∆T	1/	1,2,3		100	ppm/°C
OUTPUT VOLTAGE LINE REGULATION	Δ V ₀/ V ₀	V _{IN} = 6V to 30V	1	_	0.1	%
			2,3		0.2	
OUTPUT VOLTAGE LOAD REGULATION 2/	∆ V₀ /V₀	l. = 1 mA to 250 mA	1		0.16	%
		l. = 0.1 mA to 1 mA	2,3		0.20	
DROPOUT VOLTAGE <u>3</u> /	V1x - V0	l _i = 1mA	1		100	mV
			2,3		150	
		l. = 50 mA	1		300	
			2,3		420	1
		l. = 100 mA	1		400	

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	JET PROPULSION	LABORATORY CALIFORNIA INSTI	TUTE OF TECHNOLOGY		CAGE NO 23835
Procurement specification:					DETAIL Specification
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Custodian : Electronic Parts Reliability Section 514				SHEET	1 of 5

]			2,3	520	
		l. = 250 mA	1	600	
			2,3	800	
GROUND PIN CURRENT	Іско	i. = 1 mA	1	170	μ Α
			2,3	200	
		l. = 50 mA	1	2	mA
			2,3	2.5	
İ		l. = 100 mA	1	6	
			2,3	8	
		l. = 250 mA	1	28	
			2,3	33	
GROUND PIN CURRENT AT DROPOUT 4/	Icno	V _{II} = 4.5 V I _ι = 100 μΑ	1	210	μ Α
_			2,3	240	
GROUND PIN CURRENT AT SHUTDOWN 4/	Іано	<u>5</u> /	1	140	
THERMAL REGULATION	∆V₀/∆P₀	<u>6</u> /	1	0.2	%/W
CURRENT LIMIT	LIMIT	V out = 0	1	500	mA
			2,3	530	
OUTPUT NOISE VOLTAGE (10 Hz TO 100kHz)	e,	l. = 100 mA C. = 2.2 μF	1	TYPICAL: 400	
		l, = 100 mA G, = 33 μF	1	TYPICAL: 260	
		l. = 100 mA	1	TYPICAL: 80	

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Custodian : Electronic Parts Reliability Section 514				SHEET 1	OF 5

TEST	SYMBOL	CONDITIONS	GROUP A SUB- GROUPS	LIM	LIMITS	
				MIN	MAX	

		Cι = 33 μF <u>1</u> /				
REFERENCE VOLTAGE	Vast	<u>8</u> /	1	1.215	1.245	V
			2,3	1.205	1.255	
REFERENCE VOLTAGE LINE REGULATION	$\Delta extsf{V}_{ extsf{REF}}$	V _{II} = 2.5V to 6V V _{II} = 6V to 30V <u>9</u> /	1		0.1	%
			2,3		0.2	
EFERENCE VOLTAGE LOAD REGULATION	△VREF/VREF	I_{REF} = 0 to 200 μA	1		0.4	%
			2,3		0.6	
REFERENCE VOLTAGE TEMP. COEFFICIENT	∆VREF/∆T	<u>1</u> /	1,2,3	TYPICAL: 20		ppm/°C
FEEDBACK PIN BIAS CURRENT	l.(FB)		1		40	nA
			2,3		60	
OUTPUT "OFF" PULLDOWN CURRENT	I. (SINK)	<u>5</u> /	1	30		mA
			2,3	20		

DROPOUT DETECTION COMPARATOR

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TEST	SYMBOL	CONDITIONS	GROUP A SUB- Groups	LIM	ITS	UNITS
				MIN	MAX	
OUTPUT "HIGH" LEAKAGE	loн	V ₀₈ = 30 V	1		1	μΑ
			2,3		2	
OUTPUT "LOW" VOLTAGE	V ₀₁	Vıı = 4V I₀(COMP) = 400 μA	1		250	mV
			2,3		400	
UPPER THRESHOLD VOLTAGE	V _{THR} (MAX)	<u>10</u> /	1	-320	-150	mV
			2,3	-380	-100	
LOWER THRESHOLD VOLTAGE	VTHR	<u>10</u> /	1	-450	-230	mV
			2,3	-640	-160	
HYSTERESIS	HYST	<u>10</u> /	1	TYPIC	CAL: 60	mV
SHUTDOWN INPUT	<u>12</u> /					
INPUT OFFSET VOLTAGE	Vos	(Referred to V _{rff})	1	-7.5	7.5	mV
			2,3	-10	10	
HYSTERESIS	HYST		1	ТҮРІ	CAL: 6	mV
INPUT BIAS CURRENT	l _B	V::(S/D) = 0 to 5V	1	-30	30	nA

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TEST	SYMBOL	CONDITIONS	GROUP A SUB- GROUPS	LIM	IITS	UNITS	
				MIN MAX			
			2,3	-50	50		
AUXILIARY COMPA	RATOR						
INPUT OFFSET VOLTAGE	Vos.	(Referred to V _{nss})	1	-7.5	7.5	mV	
			2,3	-10	10		
HYSTERESIS	HYST		1			mV	
INPUT BIAS CURRENT	l _B	V _{**} (COMP) = 0 to 5 V	1	-30	30	nA	
			2,3	-50	50		
OUTPUT "HIGH" LEAKAGE	lon	V ₀₁ = 30V V ₁ (COMP) = 1.3V	1		1	μ Α	
			2,3		2		
OUTPUT "LOW" VOLTAGE	Vo.	V(COMP) = 1.1V I.(COMP) = 400 µA	1		250	mV	
			2,3		400		

NOTES: 1/ Output or reference voltage temperature coefficient is defined as the worst case voltage change divided by the total temperature

- 2/: Load regulation is measured at constant junction temperature using low duty cycle pulse testing. Two separate tests are performed, one for the range of 100 μA to 1 mA and one for the 1 mA to 250 mA range. Changes in output voltage due to heating effects are covered by the thermal regulation specification.
- 3/: Dropout voltage is defined as the input to output differential at which the output voltage drops 100 mV below the value measured with a 1 volt differential. At very low values of programmed output voltage, the input voltage minimum of 2V (2.3V over temperature) must be observed.
- 4/: Ground pin current is the regulator quiescent current. The total current drawn from the source is the sum of the ground pin current, output load current, and current through the external resistive divider (if used).

5/: Vshutdown < 1.1V, Vout = 5V.

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TEST	SYMBOL	CONDITIONS	GROUP A SUB- GROUPS	LIM	ITS	UNITS
				MIN	MAX	

- 6/: Thermal regulation is the change in output voltage at a time T after a change in power dissipation, excluding load or line regulation effects. Specifications are for a 200 mA load pulse at V" = 20V (3W pulse) for 10 ms.
 - $\underline{\textbf{7}}\textsc{/}:$ Connect a 0.1 $\mu\textsc{F}$ capacitor from the output to the feedback pin.
 - 8/: $V_{REF} \le V_{OUT} \le (V_{IN} 1V)$, $2.3V \le V_{IN} \le 30V$, $100 \mu A \le I_L \le 250$ mA.
 - 9/: Two separate tests are performed, one covering 2.5V < V_n < 6V and the other test for 6V < V_n < 30V.
- 10/: Comparator thresholds are referred to a 5V output. To express the threshold voltages in terms of a differential at the Feedback terminal, divide by the error amplifier gain = Vor/Vor.
 - 11/: Electrostatic Discharge (ESD) rating is 2 kV using a Human body model, 200 pF discharged through 1.5 k Ω .
 - 12/: Drive NOT-SHUTDOWN pin with TTL or CMOS-low level to shut regulator OFF, high level to turn regulator ON.

TABLE II. ELECTRICAL TEST REQUIREMENTS

TEST	SUBGROUPS (PER SMD 5962-38705, TABLE III)
PRE BURN-IN	1,7
POST BURN-IN	1,2,3,4,7
DELTA CALCULATIONS	1/
GROUP B END POINTS	1,2,3,4,7

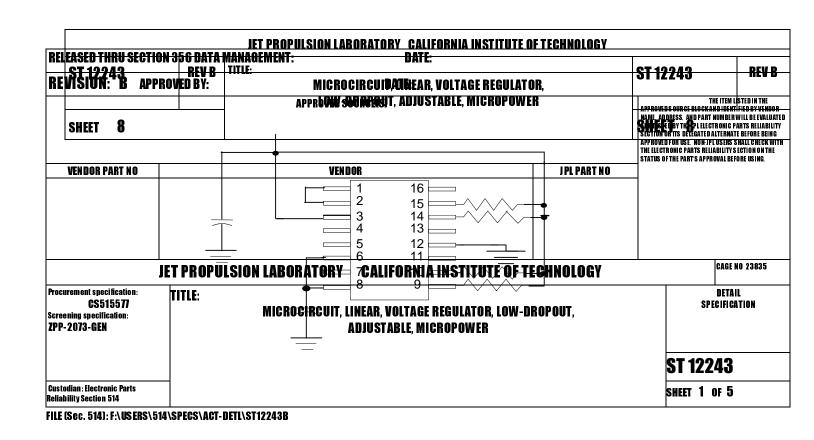
NOTES: 1/: Parameter delta calculations shall be performed with reference to the previous respective electrical measurement. The parameter delta limits shall be: $\triangle I_{010} \le \pm 10\%$ or ± 5 μ A, whichever is greater; $\triangle (V_{01} - V_{0}) \le \pm 10\%$ or ± 5 mV, whichever is greater. Devices with parameter delta calculations exceeding the parameter delta limits shall be rejected.

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Capacitors are 0.1 uF, 100 V; resistors are 100 Kohms, 1/4 watt.

FIGURE 2

TABLE III. POST-100KRAD-RADIATION ELECTRICAL TEST LIMITS AT 25°C



TEST	SYMBOL	CONDITIONS	LIMITS		UNITS
			MIN	MAX	
OUTPUT VOLTAGE	V ₀	i. =1mA,V.,=6 V	4.957	5.031	V
GROUND PIN CURRENT	I _{GND}	l. = 50 mA		2.67	mA
		l. = 100 mA		6.43	
GROUND PIN CURRENT AT Dropout	І ено	V.u = 4.5V, l. = 100 µA		236	μА

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